took measures for furthering cleanliness; ordering all students to wash their hands in chlorine water before attending the woman. Hereupon, the mortality rapidly diminished; and up to 1849 (when Semmelweiss gave up the direction), of 6589, only 142 died, or 2.15 per cent. At the same time, in the second clinique, the mortality was also low. From this time up to 1864, the mortality has never been so great as in former times; although the hospital has been visited by severe epidemics. In 1854 and 1855, there was a mortality of 9.1 per cent. and 5.4 per cent. in the two cliniques. The last epidemic occurred in the winter of 1861–62, and produced a mortality of 7.7 and 10 per cent.

Professor Spaeth discusses the cause of these visitations. They cannot, he says, be cosmical or telluric; because outside the hospital, in the neighbourhood, no such mortality has occurred. Neither does it appear that these visitations had any connection with epidemics of typhus, scarlatina, measles, etc.; for it often happened that, when these diseases were raging, the Lying-in Hospital was in a healthy condition. For does it appear that cold has any direct influence on the health of puerperal women: and if these diseases are more common in winter, the cause is to be ascribed to the want of opening the windows. For these and other reasons, the professor is convinced that the cause of puerperal epidemics lies in the hospital itself, and that its influence is exerted either during labour or within an hour after its completion. The chief, and probably the sole, agent of puerperal fever is decomposing animal matter, whether arising in the hospital or brought into it from without. The cure for the evil is, therefore, evident; great cleanliness, good ventilation, and separation of the sick from the sound. Semmelweiss was too exclusive in considering that the puerperal fever was caused solely by the infected fingers of the dissecting student.—*British Med. Journ.*, April 30, 1864.

HYGIENE.

64. *Preventive Medicine as Illustrated in the Proper Use of Food.*—[Mr. ERASMUS WILSON read a paper on this subject before the Metropolitan Association of Medical Officers of Health (Dec. 17, 1864). His views are interesting and well worthy of consideration, though we must confess we are not satisfied of the accuracy of all of them. He seems to us to have not taken into account the difference of capacity of stomachs to digest food, the alteration of diet required at different seasons, and he has also, we conceive, underrated the nutritive properties of some articles, as for example rice.—ED. AM. JOURNAL.]

"The subject which I shall endeavour to illustrate is contained in the following propositions: Firstly, that good and sufficient food is necessary to health; and, secondly, that insufficient and inferior food is a fertile source of disease. And, as a deduction from these propositions, applicable to your particular study, I will venture to add, that good and sufficient food is an element of the first importance in the prevention of disease. By food we are to understand that kind of aliment which best conduces to nutrition, growth, and strength; which is capable of producing the most complete development and highest amount of power of the human being; which, in one word, creates health; for in health we have the only trustworthy antagonist of disease. The art and the science of the physician are alike vain, in his combat with disease, unless he can bring about health; and his first and chief aim is to restore health, being fully assured that if he can succeed in renovating health, disease must be extinguished. So, the end and aim of existence of the officer of health may be said to be, to develop the means by which health may be made to occupy the ascendant in the human economy. We have one grand example before us, in which Nature prepares the food of the human being with her own hand, and administers that food at stated periods and according to a prescribed rule. We may ask, What is that food? What are those periods? What is that rule?

"The food is milk; the first food of the newly-born man; an animal food.

The periods are determined by the sense of appetite or want; and the rule which determines these periods is the space of time occupied in digestion and assimilation. If we examine this food we shall find that it is composed of a variety of principles; if we regard the periods we shall find that they present a perfect regularity of time; if we examine the rule we shall find that it has its origin in the necessities of the animal economy. And we may fairly deduce from our inquiry the three following laws:—

"The food of man must possess a variety of composition, in which the animal principle should predominate. The food of man must be repeated at regular intervals, such intervals during the waking hours being not less than three in number. And, thirdly, looking to the fact that the desire for food originates in the necessities of the individual, that the food should be uniformly nutritious. Let me put these propositions in a different manner:—

"Man requires variety in his food.

"His meals must be regular.

"Every meal should be equally nutritious.

"Looking to the milk as the food of the infant man, we see the importance which attaches to the perfect purity of the milk, its sufficient quantity, and its regularity of supply; in other words, of a healthy mother—of a mother to whom the nourishment of the future man is a primary and not a secondary purpose of life—of a mother whose instincts harmonize with those laws of nature which govern her infant and should equally govern herself.

"But let us take the reverse of these propositions: an unhealthy mother; unwholesome milk; irregularity of exhibition of that milk. I need hardly say that the results must be an unhealthy, weakly child; or, in other words, a fractious, crying child, the subject of vomiting, colic, convulsions, painful dentition, scrofula, rickets, tabes, etc. Is not this preventible disease?

"Let me illustrate the subject a little further by reference to my own practice. Eczema is not infrequent in infants; it is apt to commence at the end of the second month, and it sometimes lays the foundation of a life of suffering. Now, eczema in infants is, in every instance, an aberration from the laws of health in the composition and in the supply of the mother's milk. Sometimes the source fails, and is to be made up artificially; and we all know the extreme difficulty of supplying infants with a proper substitute for their natural diet, of rearing them 'by hand,' as it is popularly termed. In this endeavour we cannot attain either the just variety of composition or the ever-ready supply.

"But, as preventive medicine is especially interested in remote predisposing causes, let me adduce a few illustrations. A lady was called upon to give a dinner party a few weeks after her confinement; the excitement of that dinner party cost her infant an eczema. We might go further, and say that the lady transgressed a law of nature, and was punished in her offspring. A young mother hurried from the metropolis to the seaside in the month of November to attend the sick couch of a parent; she was chilled by her journey, her infant was six weeks old; the following day the child was seized with eczema. A lady, recently confined, was worried by a lawsuit; the source of her milk dried up, and remained lost for three days; a similar occurrence took place a few weeks later, and the child was visited with eczema. A poor woman, a neighbour of my own, was confined in the upper story of her house, her husband was dying in the room below. We might ask: Could the child escape under such circumstances? No: it was covered a few days after its birth with eczema. Within the last week a young woman brought her babe to me covered with eczema from head to foot. The colloquy which took place between myself and the parent was as follows: 'How old is your child?' 'Four months.' 'How long has he had this eruption?' 'Since he was three weeks old.' 'What occurred immediately before the appearance of the disease in your child to cause you annoyance?' 'I was vexed by my servant.' 'And what since?' 'I have been vexed to see my poor child in this miserable state.' 'Have you sufficient milk for him?' 'No: I think I must begin to feed him.' 'By all means do so; that is your only chance of rearing him at all.' I could multiply cases of this nature almost indefinitely were it necessary; their relation to the subject before us is self-evident, and I adduce them only as examples of causes disturbing the healthy composition of the milk, and consequently engendering disease in the child.

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"But a period comes when milk is no longer the diet of children, and when custom, originating, as we have seen, in Nature's promptings, has determined the necessity of three meals in the day. The infant demands more than three meals, and makes no distinction between the day and the night. The day of the infant is a day of twenty-four hours; the day of childhood, as of the remainder of life, has a duration of twelve to sixteen hours. The three meals at present under consideration are the morning meal, the mid-day meal, the evening meal. These meals represent the wants of the body arising during the intervening interval. The morning meal is intended to supply the moderate waste of the night, the mid-day meal the active waste of the morning, the evening meal the active waste of the afternoon. The amount of the three periods of waste is pretty equal; the amount of the supply should be equivalent to that of the waste.

"I am desirous of impressing upon my hearers my opinion and firm conviction that food is not only a necessity, but in civilized life a threefold necessity, and that the three meals should each represent the third of the nourishment of the day, and be so apportioned as to comprehend an equal amount of variety and an equal amount of nourishment. In the primitive life of the labouring class this law is fully appreciated, and is acted upon to the full extent of their means. With the exception of a somewhat more bulky mid-day meal, the morning meal and the evening meal do not far diverge from the standard of the mid-day repast.

"But the educated classes are apt to fancy that they possess a knowledge superior to that of Nature, and the result is a perversion of the law of nourishment that leads to the development of debility and disease. A careful, well-meaning mother, from purest ignorance—another expression for superior knowledge, the 'little' knowledge that is so proverbially dangerous—will tell you that she conforms to the law of Nature in providing for her children three meals in the day. She will describe those meals as breakfast, dinner, and tea, and you will find the composition of those meals to be as follows: A vegetable breakfast, namely, bread and butter, with tea and a little milk; a dinner half animal and half vegetable; and a 'tea' vegetable like the breakfast. Here, then, we find education bringing about a total change in the diet of man. Born an animal feeder, he is quickly transformed into a vegetable feeder; that is, more than two-thirds of his diet is vegetable and the remaining third only animal, the exact opposite of that which I consider should be the standard diet of children, namely, one-third vegetable and two-thirds animal.

"My deduction from these premises is, that children are almost universally under-fed, and that the majority of the diseases of children arise from the debility of constitution induced by this habit of under-feeding. If I am right in this view, preventive medicine may do much in the prevention of disease by correcting an error so widely spread.

"The diet of children of all ages should be, a substantial breakfast, with animal food in some shape; a substantial dinner of meat, vegetables, and cereal pudding; and a substantial supper, also consisting, in part, of animal food. The drink may be milk, tea, cocoa, and, possibly, beer. I would call this the diet of health; a diet capable of making a strong body and also a strong mind; and a diet capable of preventing disease. Compare it for an instant with the milk-and-water and bread-and-butter diet of some establishments; the meagre dinner of meat, and the miserable grouting of rice and amylaceous pulp. Rice and amylaceous food should have no place in the diet of health, but should be reserved for the sick room.

"Born in prejudice and matured in prejudice, it is the struggle of a lifetime to throw off the trammels of prejudice. We are apt to attach a peculiar signification to the terms which we are in the habit of employing. Ask a person what he usually takes for breakfast, and he will pretty certainly begin his enumeration with the word 'tea,' the mere drink of the meal; it is, in truth, with him a mere break-fast, instead of being, as it ought to be, a substantial morning meal. The dinner of labour is the luncheon of fashion; then follows the mildly alkaline and stimulating drink that is termed the 'tea;' and last of all comes the supper, the late dinner of fashionable life. We have, therefore, before us a succession of three meals and an intermediate drink, but the drink precedes the last meal; and, therefore, the orderly matron, who is more attentive to her 1, 2, 3 than she is to the intention of the daily fare, prescribes for her children breakfast, dinner, and tea—two slops and a meal. But let her, in good English phrase, call the children's meals breakfast, dinner, and supper, and then we immediately obtain two dinners and one slop, the breakfast—an obvious improvement. I have secured to many a child a reasonable evening meal by suggesting to the mother the mere use of the word 'supper' as the name of the third meal. No human being could call bread and butter and tea by the hearty name of supper.

"Assuming that the amount and richness of the supply of food should be determined by the offices which it has to perform, there is no period of life when more food is required than in childhood and youth. The hard-worked labourer in a long summer's day scarcely exhausts a greater quantity of nutritious matter than a growing boy of ten or twelve years of age; in the labourer the consumption is waste; in the growing boy it is bestowed in the construction of the body, in developing and building up the future man. And it is no uncommon thing to find that although the general construction of the body has been fairly performed, there is some one organ of the economy that has fared less well than the rest, and that part not uncommonly the skin; hence the origin of acne, of the ringworms, *et hoc genus omne*.

"If it be admitted that food is the source of the elements of which the body is composed, what kind of body can be expected in the case of a deficient supply of food, whether that deficiency proceed from actual want or from some perverse theory of refinement founded on a false conception of the nature and objects of food and of its direct convertibility into the flesh and blood of man? Parents are too apt to take their own stomachs as the standard of diet of their children: a cup of tea and a slice of toast suffices for them, so it must suffice for the little ones. I knew a lady who brought up her children on mutton alone, because she herself could digest nothing but mutton. Her children were a feeble, puny, sheepish race, always in the doctor's hands. A mother, in anticipation of the full meal at seven o'clock, can afford a light lunch; but she unfortunately concludes that, because a light midday meal is good for her, a spare dinner is equally proper for her children. She has heard somewhere that suppers are heavy and interfere with sleep; so, the children must be content with their tea, and go supperless to bed. Parents have rights over their children, but not the right of feeding them in such a manner as to make them the subjects of disease. Such parents become the authors of a puny and degenerate race, and are unintentionally traitors to their country.

"If the two periods of life already adverted to be important in their influence on the future man—namely, the period of infancy, ranging from birth to the age of two years, and the period of childhood, ranging from two years to seven years—the next two periods—namely, those of boyhood and youth—are equally so. While the food of the infant and the food of the child are abundant and regular, the food of the boy and the food of the youth should be the same. Both are occupied in the great business of growing life; on both are dependent the future man, for his strength and for his manhood.

"Boyhood and youth have besides other duties to perform—namely, cultivation of the mind or education; and then the question arises whether these two important processes are equally provided for in the training of our youth. To be well instructed mentally, they must be properly fed physically; and at no period of life are the three ample meals of mingled animal and vegetable food so necessary. There must be no putting off of the stomach with bread-and-butter and slop as the effigies of two of the three meals of the day; but a generous intermingling of all the elements that constitute a sound and nutritious diet.

"It is notorious that the importance of a substantial regimen is not sufficiently recognized in scholastic establishments; and the consequence to the pupils is debility and disease, a constant appeal to the doctor for tonics *vice* food, a frequent outbreak of ringworm, and, worse than all, the development of scrofulous tubercle, and the laying of a foundation for future organic disease and morbid life, or premature death.

"Ringworm is essentially a disease of defective nutrition; and those even, who, looking no deeper than the surface, believe the ringworm to be the growth of a plant in the horny covering of the skin and actively contagious by means of its seeds, are the first to admit that the seeds are incapable of vegetation without the presence of a morbid soil, of an unhealthy condition of the skin and of the economy favouring their development and growth.

"In all these examples, as it appears to me, the one most pressing want is food, abundant and regular; and could we secure this necessity of our nature to all our fellow-creatures, one-half of the whole of the disease which pervades the world would be spared.

"I must not be supposed to undervalue light, and air, and cleanliness, and exercise, the kindred of food; but if it were my commission to improve the human race; to produce finer, stronger, and better men; to extinguish disease; I should begin with food; and if it were my duty to lay down rules for the prevention of disease, I should, in the first instance, endeavour to secure the co-operation and influence of man's first and best friend—his stomach."—*Med. Times & Gaz.*, Jan. 7, 1865.

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65. *Hospital Hygiene.*—The Surgical Society of Paris, which for upwards of two months were engaged in discussing this subject in reference to the reconstruction of the Hôtel Dieu, has finally adopted the following resolutions:—

"The Surgical Society of Paris, desirous of contributing, to the extent of its power, to protect the practice of the art of Surgery from the fatal influence of nosocomial complications, and to relieve science in future from its responsibility in the matter, has deemed it opportune, on the occasion of the projected reconstruction of the Hôtel Dieu, to call to mind, or establish, the following principles: 1. A hospital should be located in an open spot upon a declivity. The space occupied by it should be of large size, fifty square metres per patient constituting a minimum, which should be exceeded as far as possible, and which should increase progressively with the number of patients. 2. The atmosphere of a hospital will be purer in proportion to its distance from crowded localities. In the middle of towns, hospitals should only be kept up of limited size for the admission of urgent cases, and for the purposes of teaching. This would prove not only a sanitary, but an economical measure, enabling great towns, like Paris, to erect hospitals on very large and inexpensive sites. 3. Good hygienic conditions are easily attainable in hospitals of from 200 to 250 beds, while it becomes almost impossible to realize them in large towns if double these numbers be exceeded. The expenses of all kinds are not proportionally greater in these than in the populous hospitals. 4. The elements of the atmosphere commingling especially in the horizontal direction, we must obviate by additional space the effects of contact and proximity constituting overcrowding, and which are propagated from patient to patient, from ward to ward, from building to building. 5. It is not only by increasing the cubic space allowed to each patient, but especially by increasing the superficial space, at present so insufficient in our hospitals, that we shall be able to struggle effectually against contagious influences. For similar reasons, the stories of a hospital should not be numerous, each of these engendering a more or less vitiated layer of air. According to rigorous hygienic requirements there should never be superposed more than two ranges of patients. 6. It would be an illusion to believe that a large supply of air within the wards will compensate for a want of space and external aëration, and that artificial ventilation can supply the place of the preceding conditions. Nothing will serve as a substitute for an insufficiency or absence of natural ventilation. 7. The buildings constituting the hospital should be completely isolated, having the same aspect, and freely exposed to the rays of the sun, and to the action of wind and rain. They should be disposed in a straight line, or in parallel lines separated by long intervals of from 80 to 100 metres, so that an